

IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. - 7. (Cancelled)

8. (Previously Presented) Method of processing a coded digital signal including a set of samples obtained by coding a set of original samples representing physical quantities using a multiresolution coding format, and including a set of information relating to a size w, h of the set of original samples and its resolution res , comprising the steps of:

locating a subset of original samples of given size $z_{ulx}, z_{uly}, z_h, z_w$ and resolution z_{res} in the set of original samples according to the set of information relating to the size w, h and the resolution res of this set;

determining, amongst coefficients of a low-frequency sub-band LL_0 of a last decomposition level obtained by decomposition into frequency sub-bands of the set of original samples, a number of coefficients per dimension of the signal which correspond to the located subset;

deciding, at the decoding side, to modify or not to modify the size of the located subset according to the determined number of low-frequency sub-band coefficients before restoring the located subset, said deciding step including taking into account at least one predetermined criterion representing a quality level for the restored subset of original samples of the digital signal; and

modifying the size of the located subset of original samples, in which the modification is an increase in the size of the subset of original samples,

wherein by representing, in a space of dimensions corresponding to the dimensions of the digital signal, a position of the coefficients of the low-frequency sub-band of the last decomposition level and a position of the subset of original samples delimited by a boundary, the increase in the size of the subset consists of moving the boundary so as to add to the subset at least one coefficient of the low-frequency sub-band per dimension of the digital signal, the at least one added coefficient being situated close to the boundary before the movement thereof.

9. (Cancelled)

10. (Previously Presented) Method of processing a coded digital signal including a set of samples obtained by coding a set of original samples representing physical quantities using a multiresolution coding format, and including a set of information relating to a size w, h of the set of original samples and its resolution res , comprising the steps of:

locating a subset of original samples of given size $z_{ulx}, z_{uly}, z_h, z_w$ and resolution z_{res} in the set of original samples according to the set of information relating to the size w, h and the resolution res of this set;

determining, amongst coefficients of a low-frequency sub-band LL_0 of a last decomposition level obtained by decomposition into frequency sub-bands of the set of original samples, a number of coefficients per dimension of the signal which correspond to the located subset;

deciding, at the decoding side, to modify or not to modify the size of the located subset according to the determined number of low-frequency sub-band coefficients before restoring the located subset, said deciding step including taking into account at least one predetermined criterion representing a quality level for the restored subset of original samples of the digital signal; and

modifying the size of the located subset of original samples, in which the modification is a reduction in the size of the subset,

wherein by representing, in a space with dimensions corresponding to the dimensions of the digital signal, a position of the coefficients of the frequency sub-bands obtained by decomposition of the set of original samples and a position of the subset of original samples delimited by a boundary, the reduction in the size of the subset consists of moving the boundary so as to remove part of the subset and all the frequency sub-band coefficients situated in the part of the subset.

11. and 12. (Cancelled)

13. (Previously Presented) Method of processing a coded digital signal including a set of samples obtained by coding a set of original samples representing physical quantities using a multiresolution coding format, and including a set of information relating to a size w, h of the set of original samples and its resolution res , comprising the steps of:

locating a subset of original samples of given size $z_{ulx}, z_{uly}, z_h, z_w$ and resolution z_{res} in the set of original samples according to the set of information relating to the size w, h and the resolution res of this set;

determining, amongst coefficients of a low-frequency sub-band LL_0 , of a last decomposition level obtained by decomposition into frequency sub-bands of the set of original samples, a number of coefficients per dimension of the signal which correspond to the located subset; and

deciding, at the decoding side, to modify or not to modify the size of the located subset according to the determined number of low-frequency sub-band coefficients before restoring the located subset, said deciding step including taking into account at least one predetermined criterion representing a quality level for the restored subset of original samples of the digital signal,

in which, by representing, in a space of dimensions corresponding to the dimensions of the digital signal, a position of the coefficients of the frequency sub-bands obtained by decomposition of the set of original samples and a position of the subset of original samples delimited by a boundary, said method further comprises a step of adding to this subset at least one coefficient of a frequency sub-band other than the low sub-band per dimension of the digital signal, the at least one added coefficient being situated close to the boundary before the movement thereof.

14. and 15. (Cancelled)

16. (Previously Presented) Method of decoding a coded digital signal which has been processed by a method of processing a coded digital signal according to any of Claims 8, 10, and 13, said decoding method comprising the steps of:

extracting the samples from the coded digital signal corresponding to the located subset of original samples having a size which has possibly been modified;

entropic decoding of these samples;

dequantization of the previously decoded samples;

reverse transformation of the decomposition into frequency sub-bands on the previously dequantized samples; and

restoration of the located subset of samples.

17. (Previously Presented) Method according to Claim 16, in which said extraction step includes extracting from the digital signal sample blocks corresponding to the located subset of original samples having a size which has possibly been modified.

18. (Previously Presented) Method according to Claim 16, in which the digital signal is an image signal, the samples of the image being arranged to constitute the rows and columns of the image.

19. (Cancelled)

20. (Previously Presented) Device for processing a coded digital signal including a set of samples obtained by coding a set of original samples representing physical quantities using a multiresolution coding format, and a set of information concerning a size w, h of the set of original samples and its resolution res , comprising:

means for locating a subset of original samples of given size z_{ulx} , z_{uly} , z_h , z_w and resolution z_{res} in the set of original samples according to the set of information of size w , h and resolution res of this set;

means for determining, amongst coefficients of a low-frequency sub-band LL_0 of a last decomposition level obtained by decomposition into frequency sub-bands of the set of original samples, a number of coefficients per dimension of the signal which correspond to the located subset;

means for deciding, at the decoding side, to modify or not to modify the size of the located subset according to the determined number of low-frequency sub-band coefficients, said means for deciding taking into account at least one predetermined criterion representing a quality level for the restored subset of original samples of the digital signal; and

means for restoring the located subset, said means for deciding being adapted to make a decision with regard to a modification of the size of the located subset before said means for restoring restore the located subset,

wherein, by representing, in a space of dimensions corresponding to the dimensions of the digital signal, a position of the coefficients of the frequency sub-bands obtained by decomposition of the set of original samples and a position of the subset of original samples delimited by a boundary, it is added to this subset at least one coefficient of a frequency sub-band other than the low sub-band per dimension of the digital signal, the at least one added coefficient being situated close to the boundary before the movement thereof.

21. - 23. (Cancelled).

24. (Previously Presented) Device for processing a coded digital signal including a set of samples obtained by coding a set of original samples representing physical quantities using a multiresolution coding format, and a set of information concerning a size w , h of the set of original samples and its resolution res , comprising:

means for locating a subset of original samples of given size z_{ulx} , z_{uly} , z_h , z_w and resolution z_{res} in the set of original samples according to the set of information of size w , h and resolution res of this set;

means for determining, amongst coefficients of a low-frequency sub-band LL_0 of a last decomposition level obtained by decomposition into frequency sub-bands of the set of original samples, a number of coefficients per dimension of the signal which correspond to the located subset;

means for deciding, at the decoding side, to modify or not to modify the size of the located subset according to the determined number of low-frequency sub-band coefficients, said means for deciding taking into account at least one predetermined criterion representing a quality level for the restored subset of original samples of the digital signal;

means for restoring the located subset, said means for deciding being adapted to make a decision with regard to a modification of the size of the located subset before said means for restoring restore the located subset; and

means for modifying the size of the located subset of original samples, wherein said means for modifying comprise means for increasing the size of the subset of original samples,

wherein by representing, in a space of dimensions corresponding to the dimensions of the digital signal, a position of the coefficients of the low-frequency sub-band of the last decomposition level and a position of the subset of original samples delimited by a boundary, the increase in the size of the subset consists of moving the boundary so as to add to the subset at least one coefficient of the low-frequency sub-band per dimension of the digital signal, the at least one added coefficient being situated close to the boundary before the movement thereof.

25. (Previously Presented) Device for processing a coded digital signal including a set of samples obtained by coding a set of original samples representing physical quantities using a multiresolution coding format, and a set of information concerning a size w , h of the set of original samples and its resolution res , comprising:

means for locating a subset of original samples of given size zux , zuy , zh , zw and resolution $zres$ in the set of original samples according to the set of information of size w , h and resolution res of this set;

means for determining, amongst coefficients of a low-frequency sub-band LL_0 of a last decomposition level obtained by decomposition into frequency sub-bands of the set of original samples, a number of coefficients per dimension of the signal which correspond to the located subset;

means for deciding, at the decoding side, to modify or not to modify the size of the located subset according to the determined number of low-frequency sub-band coefficients, said means for deciding taking into account at least one predetermined criterion representing a quality level for the restored subset of original samples of the digital signal;

means for restoring the located subset, said means for deciding being adapted to make a decision with regard to a modification of the size of the located subset before said means for restoring restore the located subset; and

means for modifying the size of the located subset of original samples, in which said means for modifying comprise means for reducing the size of the subset,

wherein by representing, in a space with dimensions corresponding to the dimensions of the digital signal, a position of the coefficients of the frequency sub-bands obtained by decomposition of the set of original samples and a position of the subset of original samples delimited by a boundary, the reduction in the size of the subset consists of moving the boundary so as to remove part of the subset and all the frequency sub-band coefficients situated in the part of the subset.

26. - 29. (Cancelled)

30. (Previously Presented) Device for decoding a coded digital signal, which has been processed by a device for processing a coded digital signal according to any of Claims 20, 24, and 25, said decoding device comprising:

means for extracting samples from the coded digital signal
corresponding to the located subset of original samples having a size which has possibly
been modified;

means for entropic decoding of these samples;

means of dequantization of the previously decoded samples;

means of reverse transformation of the decomposition into frequency
sub-bands on the previously dequantized samples; and

means of restoration of the located subset of samples.

31. (Previously Presented) Device according to Claim 30, wherein said
means for extracting extract from the digital signal sample blocks corresponding to the
located subset of original samples having a size which has possibly been modified.

32. (Previously Presented) Device according to any of Claims 20, 24, and
25, adapted to process a digital signal which is an image signal, the samples of the image
being arranged to constitute the rows and columns of the image.

33. (Cancelled)

34. (Previously Presented) Device according to Claim 20, wherein said
means for locating, said means for determining, and said means for deciding are
incorporated in:

a microprocessor,

a read only memory containing a program for processing the coded digital signal, and

a random access memory containing registers adapted to record variables modified during the execution of said program.

35. (Previously Presented) Device according to claim 30, wherein said extracting, entropic decoding, dequantization, reverse transformation, and restoration means are incorporated in:

a microprocessor,

a read only memory containing a program for decoding the coded digital signal, and

a random access memory containing registers adapted to record variables modified during the execution of said program.

36. (Previously Presented) Means for storing information which can be read by a computer or a microprocessor storing instructions of a computer program implementing the processing method according to any of claims 8, 10, and 13.

37. (Previously Presented) Means for storing information which can be read by a computer or a microprocessor storing instructions of a computer program implementing the decoding method according to claim 16.

38. (Previously Presented) Information storage means which is removable, partially or totally, and which can be read by a computer or microprocessor storing instructions of a computer program implementing the processing method according to any of claims 8, 10, and 13.

39. (Previously Presented) Information storage means which is removable, partially or totally, and which can be read by a computer or microprocessor storing instructions of a computer program implementing the decoding method according to claim 16.

40. (Previously Presented) A computer program which can be directly loaded into a programmable device, containing instructions or portions of code for implementing the steps of the processing method according to any of claims 8, 10, and 13, when said computer program is executed on a programmable device.

41. (Original) A computer program which can be directly loaded into a programmable device, containing instructions or portions of code for implementing the steps of the decoding method according to claim 16, when said computer program is executed on a programmable device.